



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:) Art Unit: 1772
Atsushi KIKUCHI et al) Examiner: C. Bruenies
Appln. No.: 10/697,978) Washington, D.C.
Date Filed: October 31, 2003) Confirmation No. 8966
For: MULTI-LAYERED PREFORM AND...) ATTY.'S DOCKET: KIKUCHI =4A

DECLARATION UNDER 37 CFR 1.132

I, Atsushi Kikuchi, Ph.D, hereby solemnly declare as follows:

1. My educational background is as follows:

Ph.D (Doctor of Engineering) in Polymer Engineering Graduate School of Science & Engineering, Tokyo Institute of Technology;
Master of Engineering in Polymer Engineering Graduate School of Science & Engineering, Tokyo Institute of Technology;
Bachelor of Engineering in Industrial Chemistry College of Science and Technology, Nihon University, Tokyo, Japan.

I have considerable experience in the present field and at present I am Assistant Research Manager, Polymer Engineering and Science in Corporate Research and Development, TOYO SEIKAN GROUP Researching Polymer Materials in the field of Packaging, especially PET bottles. I am also inventor of the following U.S. patents 6,627,279; 6,680,094; and 6,720,047. I also have the following publications:

A. Kikuchi, "Manufacturing Process and Oxygen-Absorption Material of the Multilayer PET Bottle" *Plastics Age*, (2004), March 2004, 93.

A. Kikuchi, "Heat Resistant PET Bottle", *Journal of the Japan Society for Technology of Plastics*, (2002) 43(503):1131.

2. I have read the above-identified application including specification, claims, Official Action by the United States Patent and Trademark Office mailed October 28, 2004, and relied upon prior art.

3. I further declare as fact, based on my experience and knowledge, as follows:

3a. The United States patent 5,653,265 in the name of Nakagawa et al is directed to a method of forming a hollow plastic product, which could be a bottle as schematically shown in Fig. 6, by what is commonly known as the direct blow molding method. In such direct blow molding, the freshly extruded hot hollow parison (see especially Fig. 3) corresponds at most only roughly to the preform produced according to the method of the above-identified U.S. patent application, i.e. the preform of the above-identified U.S. patent application has a bottom surface whereas the extruded parison of Nakagawa et al patent has neither a top nor bottom (see for example the Nakagawa et al Figs. 1, 7, 8a, 8b, 8c, 10 and 12).

3b. Due to the parison of Nakagawa et al being freshly extruded as a hollow tube without a top or bottom surface, if it is desired to form a bottle from such parison (Figs. 6 and 7), the bottom of the parison must be shaped and the ends brought together by a metal mold. I can therefore say as a fact, and do so state, that because the center of the bottom of the bottle in the Nakagawa et al patent must be formed from an open ended parison, such bottle will not have the same type of flow orientation as is provided in a center of a bottom which is formed from the preform of the above-identified Kikuchi U.S. patent application.

3c. I can also state, and do so state as fact, that the open ended, extruded parison of the Nakagawa patent is clearly not the same as the closed end preform of the above-identified Kikuchi U.S. patent application.

3d. When a container is molded by the direct blow molding method of the Nakagawa et al U.S. patent, the parison (which is in the molten or semi-molten state), is placed within a metal mold and internal pressure is applied (see for example air inlet passageway 26a1 in Figs. 7, 9 and 12, and the description at column 6, second paragraph) to blow out the parison and form the bottle. During this operation the bottom portion of the parison is pinched off by a metal mold to form the center part of the bottom. This center of the bottom portion is typically not drawn or stretched very much, if at all, and consequently is welded closed without

any substantial drawing, so it has little or no additional molecular orientation unlike the bottle formed from a preform as per the Kikuchi et al U.S. patent application.

3e1. The parison and the container provided by the direct blow molding method disclosed in the Nakagawa et al U.S. patent would have important different properties than the preform and the container made according to the method of the above-identified Kikuchi et al U.S. patent application. One such important difference is that the peak width at half height on the surface of the inner and outer parts of the center of the bottom, which is a characteristic of the preform and container of the above-identified Kikuchi et al U.S. patent application.

3e2. Compression molding provides a fundamentally different result because, according to compression molding, a molten or semi-molten lump of the polymer is dropped down into the cold mold just prior to manufacture of the preform. When this hot polymer lump contacts the cold mold, its outer surface, which becomes the outer surface of the preform, is immediately cooled while the remainder remains hot. Then, the mold core, which carries out the compression molding, is applied against the upper surface of the hot lump of polymer, and as the cold core contacts the hot polymer lump it cools the upper surface of the hot polymer lump, and this surface becomes the inner surface of the preform. As a result of this sequence, the outer surface of the hot polymer lump

is cooled for a relatively long time, so it becomes barely transformed during compression molding. On the other hand, the upper surface of the hot polymer lump is transformed at the same time that it is cooled, with the result that it is subjected to a large shearing stress and very substantial transformation. As a result, there are inevitable differences of flow orientation and peak width at half height on the inner and outer surfaces of the center of the bottom of the preform and also the center of the container obtained by biaxial stretch blow molding of the preform.

4. Based on my knowledge and experience, I further give my expert opinion as follows:

4a. The result achieved by compression molding the preform as stated above in paragraphs 3e1 and 3e2 immediately above absolutely cannot be achieved by following the method of Nakagawa et al U.S. patent, in my opinion.

4b. It is further my opinion that the method of the Nakagawa U.S. patent is incapable of providing the Kikuchi et al claimed preform having "a bottom portion", which bottom portion has a "center", and "having a molecular orientation and shape produced by compression molding from a composite molten resin lump."

5. There is a statement in the Official Action dated May 18, 2004, which is factually incorrect. In this Official Action, at page 6, lines 8-14, it is stated in relation to Nakagawa et al

that "at the center of the bottom portion, a half-width of a diffuse scattering peak by an x-ray diffraction of a surface of the outer layer is larger than a half-width of a diffuse scattering peak by an x-ray diffraction of a surface of the inner layer, because the three layers are transparent plastics such as polyethylene and ethylene vinyl acetate". This conclusion set forth in the Office Action is simply incorrect. Transparency of plastics is not necessary for the difference of the peak width at half-height on the inner and outer surface of the preform. Such difference is caused by the method of manufacturing of the preform, as pointed out above.

6. I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

In re of Appln. No. 10/697,978

Date: 14/3/2005

By Atsushi Kikuchi
Signature of Declarant

Atsushi Kikuchi

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